

WHAT IS CLAIMED IS:

1. A wideband optical fiber amplifier for amplifying a first and second wavelength band optical signals, comprising:

5 a first amplifying section configured to (1) be pumped in at least one direction, (2) amplify both the first and second wavelength band optical signals and (3) output an amplified spontaneous emission;

 an optical attenuator for attenuating the power of the amplified spontaneous emission; and

10 a second amplifying section configured to be pumped by the attenuated spontaneous emission to secondarily amplify the amplified second wavelength band optical signals.

2. The wideband optical fiber amplifier according to claim 1, wherein
15 said amplified first wavelength band optical signals and said secondarily amplified second wavelength band optical signals are outputted to an external optical fiber.

3. The wideband optical fiber amplifier according to claim 2, wherein said first and second wavelength band optical signals are C-band and L-band optical signals.

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4. The wide-band fiber amplifier according to claim 3, wherein the first amplifying section includes a first amplifying fiber adapted to be pumped in at least one direction.

5. The wide-band fiber amplifier according to claim 4, wherein the second amplifying section includes a second amplifying fiber adapted to be pumped by amplified spontaneous emission.

6. The wideband optical fiber amplifier according to claim 3, wherein said first amplifying section includes:

5 a pump light source having a preset wavelength; and
a wavelength selective coupler the pump light to said first amplifying optical fiber.

7. The wideband optical fiber amplifier according to claim 6, wherein said first amplifying section further includes an optical isolator for passing C-band and L-band optical signals from said first amplifying optical fiber and blocking a light traveling in the
10 backward direction.

8. The wideband optical fiber amplifier according to claim 3, wherein said second amplifying section includes:

15 a pump light source to output a pump light having a preset wavelength; and
a wavelength selective coupler to output the pump light to said second amplifying optical fiber.

9. The wideband optical fiber amplifier according to claim 3, wherein said second amplifying section includes:

- a first pump light source having a first preset wavelength;
- a first wavelength selective coupler to output the first pump light to said second amplifying optical fiber;
- a second pump light source having a second preset wavelength; and
- a second wavelength selective coupler to output the second pump light to said second amplifying optical fiber.

10 10. The wideband optical fiber amplifier according to claim 3, further comprising:

- a first circulator configured to (1) output received C-band and L-band optical signals to said first amplifying section, and (2) output the received amplified spontaneous emission to said optical attenuator;
- a first wavelength selective coupler to divide received C-band and L-band optical signals from said first amplifying section and output the divided C-band optical signals, and the divided L-band optical signals to said second amplifying section;
- a second circulator to output received attenuated spontaneous emission to said second amplifying section and output received secondarily-amplified L-band optical signals; and
- a second wavelength selective coupler to output amplified C-band optical signals from said first wavelength selective coupler, and secondarily-amplified L-band optical signals from said second circulator.